AMERICA'S SPACE PROGRAM & AMERICA'S ECONOMY

Remarks by
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to the
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AS PREPARED FOR DELIVERY

Good morning … I have to say I feel right at home here with all of you. As someone who has dedicated my adult life to the United States Marine Corps first and foremost and secondly to NASA, it is great to be at a gathering that's sponsored by organizations that focus on the Armed Forces and National Security *as well as* space.

I know it's not every day you'll hear a proud Marine complement the Air Force Association, so I hope you'll appreciate the significance of my saying how much I admire the work that the AFA and the Mitchell Institute do day-in and day-out.

I also want to say a kind word about the Space Foundation, our other sponsor this morning.
One of the things that has long held true about space exploration, is that reaching destinations like Mars and Pluto requires more than science and technology – it requires capturing hearts, minds and imaginations … whether we're talking about the public's support for investments in NASA, or the actions of a public school teacher who encourages a young girl or boy to pursue studies in science, technology, engineering and math. The Space Foundation plays a very, very important role in engaging the public in space.

If you're going to build anything that's strong enough to last, you need a strong, stable foundation.

Today I want to share with you some thoughts on why I believe that the trajectory of America's space program is as strong and stable as we've ever been – and that as a result, our industry partners have an ideal foundation from which to build.

This is true in low-earth orbit, where our commercial space initiatives are putting Americans to work in nearly every state.

It's true when it comes to deep space and the public-partnerships we have underway to develop all sorts of technologies that drive both exploration and economic growth.

It's also true within our own planet's atmosphere when it comes to aviation.

Today, we're closer to sending human beings to Mars than anyone, anywhere, at anytime has ever been.

If you read about our plan on NASA.gov/JourneyToMars you'll see that we envision strong and vibrant public sector partnerships at each stage of our Journey.

Today we operate aboard the ISS in the *Earth Dependent Stage*. In the decade of the '20's, we move to the *Proving Ground Stage* when we work in cis-lunar space where our astronauts are days or weeks away from Earth and in the decade of the '30's, we move to the final *Earth* I*ndependent Stage* when we make history by sending our astronauts first to an asteroid and then to Mars.

It goes with out saying that this is a good thing not only for our economy and not only for our space program, but for national security.

I think President Obama said it best when he laid out our Journey to Mars in 2010 – something I'll talk about a little more in moment. At the time he pledged that, and I quote, "*We will not only extend humanity's reach in space -- we will strengthen America's leadership here on Earth."*

When we use space-based diplomacy to advance American hard and soft power … it makes our nation safer and our space program stronger.

When we develop technologies that fuel America's humanitarian work – and with it our image in the world – it makes our nation safer and our economy stronger.

When we advance technologies for aviation that are used in every American control tower and aircraft – it makes our nation safer and our aerospace industry stronger.

When we make it possible to fly faster, cleaner, greener, safer and quieter – it makes our nation safer, our economy stronger and the health of our environment stronger as well.

When we're able to reduce the size of satellites, the price tag of launching them and the length of time between launches … it makes our nation safer, our Innovation Economy stronger.

Last but not least, when NASA's work in space strengthens the American economy here at home – it makes our nation both safer and stronger.

For these and so many other areas I believe firmly that NASA's Journey to Mars is benefitting America's national security at the very same time it's benefiting our economy, our environment and our exploration of space.

With this in mind, let's talk about the strong, stable foundation that the space program is providing to industry.

President Obama instructed NASA to work simultaneously with industry partners both in low-earth orbit and in deep space.
In low-earth orbit we're working with commercial partners to end our nation's sole reliance on the Russians to get our astronauts to space because the greatest country in the world ought be able to send its own people to space on American-built spacecraft launched from American soil.

Working with our partners Boeing and SpaceX, we are close to returning crewed launches to Cape Canaveral, Florida. Perhaps the biggest surprise in all this is that this is thanks to a *bipartisan* agreement across the street in Congress! *(Those are words you don't often hear!)*

At the same time, we already have a robust commercial cargo initiative that's already sent tens of thousands of pounds of cargo to the International Space Station from American soil aboard American spacecraft. We'll soon be adding the Sierra Nevada Corporation into the fold, joining Orbital ATK and SpaceX.

As we talk about commercial space, I should mention that at NASA we support the Air Force's efforts to phase out their use of the Russian-made RD-180 engines and to work with U.S. industry to develop American-built launch service solutions. This is good for our national security and good for our economy.

We're confident that American industry can meet this challenge based on our own experience working with them on commercial cargo and crew. The progress that I just alluded to on commercial space is the product of a plan we laid out several years ago to end our sole reliance on Russia for American cargo and crew access to space. This progress we've made is thanks to the hard work of thousands of people across the U.S., who are the reason that we are now resupplying the International Space Station using U.S. commercial providers and are on track to return launches of American astronauts from American soil via U.S. commercial spacecraft.

Taken together, NASA's commercial crew and commercial cargo initiatives are putting Americans to work at more than 1,000 companies across nearly every state in the Union. Furthermore, our partnerships with companies like Lockheed and Boeing are helping us reach our goals for making the Kennedy Space Center a multi-user spaceport. At one time this was considered by some to be a pipedream. Today, Americans working at companies like these in Cape Canaveral, Florida are making good salaries, putting food on the table and paying tuition for their children.

From Day 1, the President's strategy has been to use these initiatives to build a commercial market in low earth orbit – strengthening America's economic competitiveness in the global innovation economy and strengthening communities throughout our country by putting Americans to work.

Switching gears to deep space and the potential flowing from public-private partnership, President Obama directed NASA to partner with American entrepreneurs, innovators and inventors on developing the technologies that drive exploration and job creation. These would come to be technologies like habitats and habitat systems, 3D printers, space veggies, medical devices, propulsion systems and so forth … technologies that astronauts will use to one day live and work on Mars and safely return home … technologies that have a lot of potential spinoff benefits here on Earth.

On the topic of deep space, I'd be remiss if I didn't mention that *Orion* and the Space Launch System – or SLS -- are both reaching important milestones.

In December of 2014, a ULA Delta IV Heavy launched the Lockheed-built *Orion* spacecraft farther into space than any vehicle designed for human crew has traveled in generations. This year, NASA employees and contractors are outfitting the crew module with the spacecraft's heat-shielding thermal protection systems, avionics and subsystems like electrical power storage, cabin pressure control and flight software.

We're also going to complete direct field acoustic testing as well as structural integrity tests.

When it comes to the Space Launch System, we're preparing for a second series of RS-25 engine tests – and SLS by the way isn't only poised to launch astronauts and supplies into deep space, it's already launching a new era for America's space industry …

Just last Friday, I had the opportunity to visit our NASA team at the Marshall Space Flight Center in Huntsville, Alabama to present them with an award for all the incredible work they are doing to support small business.
One of the things we spoke about while there is how SLS, which is being manufactured at our Michaud facility in Louisiana and managed out of Marshall, is such a boon to small business.

Consider this: Approximately 40 percent of the raw materials and components used by the prime contractors to build the SLS rocket are being produced by small businesses across the U.S. That's impressive, isn't it? All told, more than 800 small businesses in 43 states around the country are providing components to develop the Space Launch System. Think about that for a minute… 800 small businesses across the nation are making it possible for us to launch SLS and reach Mars.

None of the incredible progress we've been making happened by accident … and just a few short years ago, none of this was a given. Those of you who I saw at the Space Foundation's Space Symposium in Colorado might have heard me talk about that oft repeated saying: "Space is hard."
When President Obama first took office, he asked an independent committee chaired by former Lockheed CEO Norm Augustine to conduct an independent review of our space program. The commission, which included such distinguished Americans as my late friend, Sally Ride, determined that quote *"The U.S. human spaceflight program appears to be on an unsustainable trajectory."*

Trust me when I say that I take no joy from repeating these words – but it is an important benchmark of where we were and how far we've come.

When the Augustine Commission released their report, sending American astronauts to Mars was something many of us had dreamed of doing for many years – but at the time, it was really, just a vague, horizon goal. There was no realistic or sustainable plan in place for getting there. There was no timetable.
There wasn't even anything close to a consensus on Mars as a destination.

At the same time, we were still recovering from the devastating and tragic loss of Space Shuttle *Columbia* in 2003. The Columbia Accident Investigation Board had recommended that the Space Shuttle Program be phased out. Many of us agreed with their recommendation, including the fellow who's speaking to you.

This was not a decision at which I arrived lightly. I traveled to space four times on the Shuttle. I loved the Shuttle. It had a remarkable, three decades long run like no other. However, every technology evolves over time and it was time to focus on destinations farther out into space.

President George W. Bush agreed and you will recall that he directed the phase out of the Space Shuttle Program.

So this was the situation in which we found ourselves when President Obama came to the Kennedy Space Center in April of 2010 and delivered what I consider to be one of the landmark addresses in the history of the Space Program.

The centerpiece of his remarks was a challenge to NASA: send American astronauts to Mars in the 2030s and do so in a way that strengthens our economy, our environment and our understanding of the universe, our place in it and the most important planet of them all: Earth.

Six years later, we are on a trajectory that is not only sustainable, it's affordable, it's enjoying support across parties and sectors and it has pointed our progress firmly toward Mars.

I honestly wouldn't have believed you six years ago if you had told me that I'd be able to look you in the eye today and tell you that not only does NASA have a plan for sending American astronauts to Mars in the 2030s, but also there's a consensus starting to emerge in the scientific and policy communities around it.

One of the great indicators of progress that I see virtually everywhere I travel is that people don't smirk or laugh or look at you like you're from Mars yourself when you tell them that we're headed to the Red Planet.

Less often are folks asking, *"Why aren't you doing things my way?"* or *"Is Mars the right destination?"* Rather, they're asking, *"How can we be a part of this?"* and *"What are some areas where we can work together?"*

One final thing: I know we're here to talk about space, but I did want to say just a very, very brief word about aeronautics.

You might have heard that President Obama is calling for a $3.7 billion investment in green aviation for NASA over the next ten years. With this investment is going to come a lot of opportunity for public-private partnership, particularly when it comes to the development of a new series of experimental aircraft known as X-planes.

The potential here is a future where we fly on aircraft that consume half as much fuel and generate only one quarter of current emissions; aircraft that make use of greener energy sources and fly safer, faster and quieter; aircraft that allow people to travel to most cities in the world in six hours or less in an airplane that flies faster than the speed of sound over land with hardly a hint of a sonic boom.

Taken together, I think it is clear that President Obama has set us on a visionary course. It is my sincere hope that future leaders see it through.

As I said at the beginning of my remarks today, space is hard, but with the vision provided by the President and the motivation and determination of our NASA – contractor team, we will continue to turn science fiction into science fact and make the impossible possible. I truly hope that every one of you will work to join us on this incredible journey.

Thank you all very much.